



Deformation and metamorphism in an eclogite-bearing shear zone within the Sveconorwegian Orogen, Sweden

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The Eastern Segment is the counterpart to the Parautochthonous Belt in the Grenville Province, and represents a part of the Fennoscandian Shield that was thoroughly reworked during late stages of the Sveconorwegian orogeny (~1.1-0.9 Ga). Relics of eclogite occur as lenses in high-grade gneisses in a part of the southern Eastern Segment. These rocks constitute evidence of a high-pressure event at c. 0.98 Ga, followed by regional deformation and metamorphism in the granulite and upper amphibolite facies.

Structural and petrological data combined with airborne magnetic anomalies have been used to define the structure and the relationship between deformation and metamorphism related to the Sveconorwegian orogeny. Along the southern and intensely deformed boundary of the eclogite domain, the Ullared Zone, three main deformation phases (D1-D3) have been identified. D1 is identified as a lithotectonic and gneissic layering with locally preserved isoclinal folds. These structures were overprinted by a major deformation phase (D2), which affected heterogeneously the entire southern Eastern Segment. D2 is characterized by asymmetric tight to isoclinal folds, commonly with a well-developed axial planar mineral fabric. The folds are associated with shear sub-parallel to their axial planes in areas where the deformation was intense. They are interpreted as the consequence of tectonic extrusion of eclogitic-bearing crust into mid-crustal levels, resulting in decompression and retrogression of eclogite under high-pressure granulite and upper amphibolite conditions. This deformation resulted in strong E-W to WNW-ESE stretching, associated with systematic top-the-east sense of shear. Late open upright folding (D3) with predominant NNE-SSW axes is superimposed on D2.

Ongoing studies aim at constraining the P-T-t path of the eclogite-bearing unit and surrounding units by multi-equilibrium thermobarometry and pseudosections. The metamorphic evolution will be linked to the structural model and allow interpretation of the tectonic evolution during late stages of the Sveconorwegian orogeny.